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10/828,261	04/21/2004	Shuji Hirakata	119506	4840

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EXAMINER	
WANG, EUGENIA	
ART UNIT	**PAPER NUMBER**
1745	

MAIL DATE	DELIVERY MODE
09/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/828,261	HIRAKATA ET AL.	
	Examiner	Art Unit	
	Eugenia Wang	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 August 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the reply filed August 9, 2007:

a. Claims 1-12 are still pending.

b. The previous objection to the drawings have been withdrawn in light of the amendment.

c. The previous objections to the specification have been withdrawn in light of the amendment.

d. The previous 112 rejection has been withdrawn in light of the amendment.

e. The rejection of record is maintained, thus the action is final.

Information Disclosure Statement

2. The information disclosure statement filed August 2, 2007 has been placed in the application file and the information referred to therein has been considered as to the merits, with the exception of DE 69701432. (Note only the English abstract of DE 10054745 has been considered.) For full consideration, Examiner invites Applicant to submit the English translation.

Drawings

3. The drawings were received on August 9, 2007. These drawings are accepted.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-9 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2001/0053469 (Kobayashi et al.).

As to claim 1, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine the temperature of the fuel cell – T3, which measures cathode exhaust prior being introduced to a compressor, and T2, which measures cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is lower than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). The abnormality discovered is based off of the internal temperature of the fuel cell and would inherently pertain to something within the fuel cell (be it the stack or the temperature sensor). The driver would then be motivated to discover what the abnormality stems from, and thus the controller [4] and the alarm lamp function as an abnormality determination unit and a warning issuance unit.

Alternately, it can be interpreted that Kobayashi et al. does not specifically notify the driver of an abnormality that definitely corresponds with the temperature sensor.

However, the abnormality discovered is based off of the internal temperature of the fuel cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor). The motivation form making the differentiation of what the abnormality pertains to is to give the driver more information about where the problem with the fuel cell lies. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to further differentiate between a temperature detector defect or a fuel cell stack defect in order to make malfunction determination easier on the driver.

As to claim 2, Kobayashi et al.'s system, since it has temperature sensors, a controller, which also detects abnormality, as well as a warning issuance unit (as exemplified by the warning lamp function), would be capable of being programmed in such a manner that the warm-up process (temperature maintenance operation) is stopped via controller [4] when the fuel cell operating temperature detected by temperature detector (T2 and T3 represent internal fuel cell temperature to some degree) exceeds or is equal to a second reference temperature which is higher than the first reference temperature.

It has been held that the recitation of an element is "capable" of performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson,* 69 USPQ 138.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art

in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

As to claim 3, Kobayashi et al. has a plurality of temperature detectors, as previously mentioned T1, T2, and T3 (fig. 1). Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line. Although the abnormality is tested in the T2 and not T3 line, apparatus taught would be capable of applying the abnormality test to both internal temperature indicators. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

As to claim 4, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine temperature of the fuel cell – T3, which measures

cathode exhaust prior being introduced to a compressor, and T2, which measures cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. (Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line.) Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is lower than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). Although the abnormality is tested in the T2 and not T3 line, apparatus taught would be capable of applying the abnormality test to both internal temperature indicators. Additionally, the apparatus of Kobayashi et al. is also capable of continuing temperature-maintenance operation if no abnormality is detected in the remaining temperature detectors, where abnormality is determined when the temperature detectors detect a temperature equal to or less than a first reference temperature. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

Alternately, it can be interpreted that Kobayashi et al. does not specifically notify the driver of an abnormality that definitely corresponds with the temperature sensor. However, the abnormality discovered is based off of the internal temperature of the fuel

cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor). The motivation form making the differentiation of what the abnormality pertains to is to give the driver more information about where the problem with the fuel cell lies. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to further differentiate between a temperature detector defect or a fuel cell stack defect in order to make malfunction determination easier on the driver.

As to claim 5, Kobayashi et al.'s system, since it has temperature sensors and a controller, which also detects abnormality, would be capable of being programmed in such a manner that the warm-up process (temperature maintenance operation) is stopped via controller [4] when the fuel cell operating temperature detected by temperature detector (T2 and T3 represent internal fuel cell temperature to some degree) exceeds or is equal to a second reference temperature which is higher than the first reference temperature.

As to claims 6-10, Kobayashi et al.'s warning would signal with an abnormality of the temperature detector, where a problem in the temperature detector would inherently be indicated. However, a disconnection or short circuit is not exemplified. However, Kobayashi et al.'s system, which contains all of the components as that of the claimed invention, would be capable of having the temperature detector send a signal indicating disconnection or short-circuit to controller [4]. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

Claim Rejections - 35 USC § 103

5. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al in view of US 2003/0029179 (Vander Woude et al.).

As to claim 11, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine the temperature of the fuel cell – T3, which measures cathode exhaust prior being introduced to a compressor, and T2, which measures cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. (Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line.) Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is *lower* than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). The abnormality discovered is based off of the internal temperature of the fuel cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor).

Kobayashi et al. does not specifically teach that the abnormality detected and warning issued corresponds specifically to the temperature detector. However Vander Woude et al. teach a cryogenic temperature control apparatus and method. The system

provides a plurality of temperature values to a controller (abs). Furthermore, controller [34] is programmed to accommodate failure of the sensors (para 044, lines 1-2). Vander Woude et al.'s method determines if sensors are damaged or defective – checking if the temperature sensors [45, 46] fall outside a certain range (para 0044, lines 2-7). If the sensor fails, the control apparatus [12] activates an alarm (para 0044, lines 8-10). The motivation for combining the Vander Woude et al. teaching with the Kobayashi et al. teaching is that they address the same problem, an abnormality with a system that is dependent on temperature values. Furthermore, it would further be a motivation to provide a fuel cell system (as taught by Kobayashi et al.) that can determine whether the fuel cell stack has the problem or the temperature sensor has the problem, so that it can be fixed more easily. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to combine the defective temperature sensor method or Vander Woude et al. with the fuel cell system of Kobayashi et al. in order to more effectively inform the user of the specific placement of a defect in the fuel cell system (specifically the temperature sensor).

As to claim 12, Vander Woude et al. teach a system where defrosting is initiated when the evaporator coil outlet temperature (ECOT) is equal to or less than -40°F (para 0053, lines 1-3). Once the defrost mode is initiated, the defrosting continues until the ECOT reaches 59°F (para 0054, lines 1-5). (Again, the art of Kobayashi et al. and Vander Woude et al. can be combined, because they are used to solve the same problem– detecting abnormality (as discussed with the claim 11 rejection).

Furthermore, this mode of operation of Vander Woude et al. pertains to warming-up of a system, as is taught by Kobayashi et al.)

Response to Arguments

6. Applicant's arguments filed August 9, 2007 have been fully considered but they are not persuasive.

(a) Applicant argues that Kobayashi fails to disclose a temperature-maintenance operation controller that ... while the fuel cell system is not operating, executes temperature-maintenance operation of the fuel cell because Kobayashi et al. discloses operation under either a warm-up mode or a normal mode, not in a maintenance mode.

Examiner would like to specifically note that Applicant recognizes that the above language only appears in claims 1 and 4 (the apparatus claims) and not in 11 (the method claim). Therefore, Examiner will direct the response towards the apparatus claims rather than the method claims.

Examiner respectfully disagrees. It can be taken that in the warm-up mode can be interpreted as a mode when the fuel cell system is not operating, as it is warming up and not in full operation. Additionally, without a specified definition of maintenance mode, both the normal mode or warm-up mode could be defined as a maintenance mode as well. Finally, such recitations are purely functional, in the fact that Kobayashi is capable of performing them.

It has been held that the recitation of an element is "capable" of performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson,* 69 USPQ 138.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

(b) Applicant also argues that Kobayashi et al. fails to disclose an abnormality detection unit (or step of determining whether abnormality has occurred) that determines whether a detected abnormality regarding said fuel cell operating temperature has occurred in said temperature detector, because the abnormality

determination is based on results obtained from the thermo-sensors and does not specifically detect the abnormality in the thermo-sensor.

Examiner respectfully disagrees. With respect to the structural claims of 1 and 4, Examiner will exemplify the rejection of claim 1 for brevity's sake, as similar rejections are applied to both. Examiner's position is that an abnormality in temperature is indicative of either an abnormality of the fuel cell stack or an abnormality of the temperature sensor. So in such a manner, the system of Kobayashi et al. would still detect abnormalities within the temperature system. Furthermore, an obviousness statement is also made as to why one would specifically differentiate for the different possible causes for the abnormalities within the temperature system. Such reasoning, listed below, is not addressed: "Alternately, it can be interpreted that Kobayashi et al. does not specifically notify the driver of an abnormality that definitely corresponds with the temperature sensor. However, the abnormality discovered is based off of the internal temperature of the fuel cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor). The motivation form making the differentiation of what the abnormality pertains to is to give the driver more information about where the problem with the fuel cell lies. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to further differentiate between a temperature detector defect or a fuel cell stack defect in order to make malfunction determination easier on the driver."

Applicant argues that Vander Woude does not suggest modifying Kobayashi to overcome the above deficiencies of Kobayashi et al.

With respect to (a), Examiner would like to reiterate that such claim language is not within independent claim 11, and, accordingly, such arguments do no apply to it.

With respect to (b), it is Examiner's position that Vander Woude does provide the abnormality detection unit as claimed and can be combined, as they solve a similar problem. Therefore, the argument with respect to (b) does not apply to claim 11 either. Although a statement is made that there is no suggestion for modification is made, Applicant has not set a reason as to why there is no motivation to modify. Examiner's position holds that since the same problem is being solved (detection of abnormality), there is motivation for combining.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugenia Wang whose telephone number is 571-272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EW

GREGG CANTELMO
PRIMARY EXAMINER

9/12/07